AMENDMENTS TO THE CLAIMS

1. (currently amended) A method for producing a thin sample band in a microchannel system, said method comprising the steps of:

a.) ~~providing~~ forming a junction ~~formed~~ at an intersection of at least four ~~transport~~ channels ~~lying~~, wherein each of said channels has a first end contiguous with said junction and a second end opposite said first end, wherein each of said channels lie in a substantially common plane, ~~said channels having first and second ends, said channel first ends contiguous with said junction, said~~, wherein first and second channels are substantially co-linear and disposed along a primary axis, and wherein ~~said~~ third and fourth channels lie on opposite sides of said primary axis;

b.) filling each of said channels and said junction with a transport medium, wherein said channels, and said junction are all in communication with each other, and wherein said transport medium filling said third channel comprises a quantity of a sample material comprising one or more species;

~~c.) inserting a band of a sample material into a region near said first channel first end, said material comprising one or several species; and~~

~~d~~c.) applying first electric fields along ~~each of~~ said third and fourth channels in order to induce transport of some of said ~~species,~~ sample material along said third channel and into said fourth channel and filling a region of said first and second channels adjacent to said junction with portions of said sample material;

d.) removing said first electric fields;

e.) applying second electric fields along said second, third, and fourth channels thereby transporting a portion of said sample material out of said junction and said

second channel first end and into said third and fourth channels, wherein a band of said sample material remains in said first channel first end proximate said junction;

f.) removing said second electric fields;

g.) applying third electric fields along said first, second, third and fourth channels wherein said sample band in said first channel first end is transported into said junction, said transport causing said sample band to expand into said junction toward said second, third and fourth channels ~~such that~~ wherein end portions of said sample band enter said third and fourth channel**[[s]]** first ends thereby causing said sample band to be stretched and thinned while traversing said junction, and wherein a center portion of said sample band is disposed in a region proximal to said second channel first end; and

h.) removing said third electric fields.

2. (canceled)

3. (canceled)

4. (currently amended) The method of claim **[[3]]1**, wherein said first, second, and third electric fields produce electroosmotic motion of said transport medium thereby causing said sample band to be carried along with said transport medium.

5. (currently amended) The method of claim **[[3]]1**, wherein some of said species comprise ionic species and wherein said first, second, and third electric fields produce combined electroosmotic motion of said transport medium and electrophoretic motion of ionic species within said sample band thereby causing said sample band to move with, and relative to, said transport medium.

6. (original) The method of claim **1**, wherein the transport medium is substantially stationary.

7. (currently amended) The method of claim **6**, wherein said species comprise ionic species and wherein said first, second, and third electric fields produce electrophoretic motion of said ionic species relative to said transport medium thereby causing motion of said sample band through said channels and junction.

8. (currently amended) The method of claim **1**, wherein said channel second ends are each connected to separate reservoirs, wherein each of said reservoirs ~~each containing~~ include electrodes connected to an electrical power supply, said power supply used to control said electric fields along each of said channels.

9. (currently amended) The method of claim **1**, wherein the step of applying third electric fields ~~is performed such that said electric fields along said third and fourth channels are the same, resulting thereby in~~ produces transport of equal portions of said sample band into said third and fourth channels ~~such that~~ wherein said sample band remains symmetric about said primary axis.

10. (canceled)

11. (canceled)

12. (canceled)

13. (canceled)

14. (currently amended) The method of claim **1**, further comprising the step of applying fourth electric fields along said first, second, third and fourth channels ~~such that,~~ wherein said sample band is transported from ~~a~~ said region proximal to said second channel first end, ~~and~~ across said junction toward said first channel first end ~~such that,~~ wherein portions of said sample band enter said third and fourth channels thereby

causing said sample band to be further stretched and thinned while traversing the junction.

15. (currently amended) The method of claim **14**, further comprising the step of reversing the direction of said fourth electric fields along said first and second channels at least once, ~~such that~~ wherein said sample band is transported across said junction multiple times causing said band to thin additionally ~~upon~~ with each traverse of said junction.

16. (currently amended) The method of claim **15**, ~~and~~ wherein ~~said sample band is initially inserted proximal to said first channel first end and wherein further~~ the total number of reversal steps is odd ~~such that~~ wherein, said sample band is finally positioned ~~proximal to~~ in said first end of said second channel ~~first end~~ proximate to said junction.

17. (currently amended) The method of claim **15**, wherein ~~said sample band is initially inserted proximal to said first channel first end and wherein further~~ the total number of reversal steps is even ~~such that~~ , wherein said sample band is finally positioned ~~proximal to~~ in said first end of said first channel ~~first end~~ proximate to said junction.

18. (original) The method of claim **1**, wherein said third and fourth channels are substantially co-linear along a secondary axis, wherein said secondary axis is perpendicular to said primary axis.

19. (original) The method of claim **1**, wherein each of said channels has a width.

20. (original) The method of claim **19**, wherein the widths of said channels are substantially the same.

21. (original) The method of claim **20**, wherein the junction formed at said intersection of said channels is square, and wherein each side of said junction is equal to said channel width.

22. (currently amended) The method of claim **19**, wherein said junction has a height perpendicular to said ~~primary axis~~ common plane which is greater than the smallest channel width.

23. (original) The method of claim **19**, wherein a width of said junction along said primary axis is larger than the smallest channel width.

24. (original) The method of claim **19**, wherein the width of at least one channel is less than about 1000 microns.

25. (original) The method of claim **1**, wherein a portion of said microchannel system comprises a separation matrix disposed therein.

26. (currently amended) The method of claim **8**, wherein said electric fields are controlled by the step of:

applying an electric potential to each of said electrodes, wherein each of said electric potentials ~~having~~ comprise a magnitude and a polarity**[[;]]**, and wherein

~~by varying each of said potential~~ each of said magnitudes and polarities is varied.

27. (original) The method of claim **8**, wherein said electric fields are controlled by varying a magnitude and a polarity of an electric current flowing to or from each of said electrodes.

28. (currently amended) A method for producing a thin sample band in a microchannel system, said method comprising the steps of:

a.) providing a junction formed at an intersection of at least four ~~transport~~ channels lying in a common plane, each of said channels having first and second ends, said ~~channel~~ first ends of said channels contiguous with said junction, ~~said~~ wherein first and second channels are substantially co-linear along a primary axis, and wherein ~~said~~ third and fourth channels lie on opposite sides of said primary axis;

b.) providing a reservoir and an electrode means at each of said ~~channel~~ second ends of said channels;

c.) providing a power supply connected to said electrodes, said power supply for applying electric fields along said channels;

d.) filling said channels, reservoirs and junction with a transport medium;

e.) introducing a quantity of a sample material into said reservoir at said ~~third channel~~ second end of said third channel;

f.) applying first electric fields along said ~~transport~~ channels in order to induce transport of some of said sample material into said junction from ~~the~~ said first, second and third channels, and out of said junction from the fourth channel, ~~such that~~ wherein a stream of said sample material is transported along said third channel in a direction toward said fourth channel, and wherein said stream is narrowed and focused at said junction under the influence of said electric fields ~~such that~~ wherein said narrowed sample stream continues to travel along said fourth channel away from said junction;

g.) removing said first electric fields;

h.) applying second electric fields along said third and fourth channels ~~such that~~ wherein said direction of travel of said narrowed sample stream is reversed, and wherein a portion of said narrowed stream is transported ~~through said junction and~~ back into said third channel;

i.) removing said second electric fields; and

j.) applying third electric fields along each of said ~~four~~ channels in order to induce transport of some of said sample material into said junction from said first channel and out of said junction into said second, third, and fourth channels, ~~such that~~ wherein a portion of said narrowed sample stream enters said second channel forming a thinned sample band.

29. (canceled)

30. (canceled)

31. (canceled)

32. (canceled)

33. (canceled)

34. (canceled)

35. (canceled)

36. (canceled)

37. (canceled)

38. (canceled)

39. (canceled)

40. (canceled)

41. (canceled)